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plaints received from Fellows of the Society who cannot obtain seats at the Evening Meeting, the Council call attention to the Rule (Chap. v. Sect. 3, Par. 2):—

“Visitors, if introduced by Fellows, may be present at the Ordinary Meetings; but the privilege of introducing Visitors shall be limited to *one* only, and should a Fellow desire to introduce a second, he is requested to apply to the Acting Secretary for a special card of admission;” and the Council have further resolved,—

“That no Visitor, excepting those *personally* introduced by Fellows, be admitted to the Room before 8.15 P.M.”

The Meeting was then adjourned to Monday, February 23rd.

*Seventh Meeting, Monday, February 23rd, 1863.*

SIR RODERICK I. MURCHISON, K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—*Commander Charles J. Bullock, R.N.; the Chevalier Duprat; Alfred Barry; Antonio Gabrielli; W. E. Heathfield; S. H. Hinde; George Macfarlan; and John Thomas, Esqrs., were presented upon their election.*

ELECTIONS.—*Major Francis J. Rickard; Arthur Anderson; James P. Brown; A. Bertie Cator; John L. Ellerton; Robert Gillies, C.E.; Rowland Hamilton; Loton Holland; James H. Kerr, R.N.; James E. McConnell, C.E.; Frederick Pearson; John Ritchie; George M. Robinson; William A. Ross; H. Duncan Skrine; and James Thomson, Esqrs., were elected Fellows.*

ACCESSIONS.—Among the donations to the Library and Map-rooms since the former meeting were—Hughes’ ‘Geography of British History;’ Adams’ ‘Geography Classified;’ Wills’ ‘Successful Exploration through Australia;’ continuation of Philip’s Imperial Library Atlas; Clark’s Map of the Holy Land; Admiralty Charts, Ordnance Maps, &c. &c.

EXHIBITIONS.—Several diagrams illustrative of the Formation of Icebergs in Greenland; Clark’s Map of the Holy Land; Railway and Geological Maps of the United Kingdom, by S. Clarke, &c. &c., were exhibited.

The Papers read were—

1. *Rupert Land, the Colony and its Limits.* By CAPTAIN MILLINGTON H. SYNGE, R.E., F.R.G.S.

THIS paper opened with an allusion to those read before the Society by the same author (*vide* vol. xxii. ‘Journal’), which treated of the physical geography of the interior of British North America, as

demonstrating the feasibility of a communication across it from ocean to ocean. The features of the country were therein described, and the fact of an unbroken natural navigation was shown to exist between the Atlantic and Pacific; as also, by way of the Mackenzie River, between the Arctic Sea and either of the above oceans. Telegraphic intercourse was now about to be established between Canada and British Columbia by the joint efforts of these colonies, and an open intercourse would inevitably follow.

The intervening country was now used merely for hunting purposes, and it was alleged that the remunerative character of the fur-trade would be destroyed by the opening of the country. Its present holders were accordingly averse to the impending steps in that direction. It was not the intention of Captain Synge to recapitulate his former arguments on the advisability of opening the country, but to complete the examination of the case under the aspects of historical and political geography.

The first mention of Rupert Land—and Rupert Land, whatever that may be, is the country over which alone any claim can be advanced by a corporate body—occurs in the charter granted by King Charles II. to a company styled that of “Adventurers trading to Hudson Bay.” With the Restoration the spirit of maritime adventure had revived, and the prosecution of an enterprise for the discovery of a short passage to the South Sea was again ardently desired. This object had fired the genius of Columbus; had led to nearly all the brilliant enterprises by which America was discovered, seized, and settled; became subsequently an object of research in a more and more northerly direction, until it finally assumed the name of the North-West Passage. To prosecute this search was the object of the applicants for the charter and also of the King. The grant is specified to be for this purpose, as conducive to the good of the whole people. It is also specified that Rupert Land is to be “a colony,” and governed in harmony with the laws of England. This grant is worded so as to convey a monopoly of trade and of land upon the seas and borders of the supposed Passage. Read by this light—that of the day in which the charter was granted—it is obvious that its array of geographical phrases is made for the purpose of legal exhaustion of terms necessary in order to prevent any trespass upon the monopoly; but the whole is bounded by the condition of proximity to the supposititious Passage by the express terms of *coasts and confines*. There is also an *excepting* clause, viz. that the country be not at the time granted to or possessed by the other subjects of the King, or of any other Christian prince or state.

The country at the present day attempted to be claimed under these terms embraces, however, the whole head-waters of the Red River and of the Saskatchewan. These countries are in no wise contiguous to Hudson Straits, and they were occupied by the French or by those who inherited the French pretensions, not by the Company of Adventurers.

This enlarged claim rests exclusively upon a very strained interpretation of the word "rivers." The inland navigations of America are by great lakes, and not by rivers. Besides, the word "rivers" is sufficiently clearly shown to signify the embouchures necessary to give rights upon the *confines* of the Straits, first, by the express use of that term; secondly, by the excepting clause; and thirdly, by the total omission of any reference to a land frontier as determined by a watershed. Historical geography entirely corroborates this view, for no exclusive claims to either the trade or land of the interior was set up until the whole of the traders into these regions were amalgamated into one body after the great conflicts with the North-West Company of Canada. During these conflicts the Hudson Bay Company advanced no pretensions of right to a monopoly. All the public instructions both of the Home and Colonial Governments decide that an equal right existed on either side within legal limits, and it was only subsequently to the amalgamation that it became the common interest of all to set up these pretensions under the only document giving semblance to a right on which these enlarged claims could be based. The French posts extended to Fort Pis-cayac, on the Saskatchewan, besides others seen by Mackenzie as far as Athabasca Lake.

The country required for the purposes of establishing the over-land transit, in the first instance, was not within the limits of Rupert Land; but Rupert Land was a grant in trust for the purpose of attaining the objects of that short and rapid communication.

The PRESIDENT said the object of the author of the Paper was to see established free communication between the two great British possessions upon the east and west of North America. The communication involved other considerations of international law and of the effect to be given to the wording of charters and treaties, upon which few of those present were competent to speak. Fortunately he saw his friend Dr. Travers Twiss near him, and he would ask that gentleman to offer a few observations upon the subject.

Dr. TRAVERS TWISS said, assuming that the Hudson Bay Company had under their charter a power to throw impediments in the way of a passage, whether by telegraph or railway, through the Rocky Mountains, there was still a higher power at home which could remove those impediments; therefore he did not at all despair of overcoming them, assuming that they did exist. In addition to the legal and geographical question, there was also the historical view, which was not precisely as Captain Syngé regarded it. The real difficulty which arose in regard to almost all charters and treaties of boundary resulted

from the disposition of diplomatists to take a river as a boundary, which, when traced to its head sources, threw everything into confusion. A difficulty of this character arose between ourselves and the United States, when we came to trace the head-waters of the rivers that were to separate the north-east boundaries. In the grant to the Hudson Bay Company, the phrases "land upon the rivers," "territory upon the rivers," were made use of. It has always been understood, both in grants and treaties, when these words are used, that they mean all the land upon the rivers up to their head-waters—up to the high lands where they take their rise. Assuming for the moment that in the grant to the Hudson Bay Company all the land upon the rivers was included, we then had to trace the head-waters of those rivers; and it would be found, precisely as it was discussed at the Treaty of Utrecht, that we should have to commence with Lake Mistassinnie, then come to the Lake Abitibis, then to the Rainy Lake—the waters of which flow into the Lake of the Woods, and thence into Lake Winnipeg, and finally find their way into Hudson Bay. From the Rainy Lake we must trace a line to the Red Lake, follow that up to Lake Travers, which is at the head of the Red River, in lat. 45°, and thence keep on to the lowest sources of the Saskatchewan, in lat. 48°. Thus we get the real geographical boundary, or the head-water-line, of the grant to the Hudson Bay Company, inasmuch as all these rivers flow northwards, and find their way, through a most intricate navigation, ultimately into Hudson Bay. Of course the grant was limited, if it proved to conflict with a previous grant, or with land in the occupation of other countries. Besides the Hudson Bay Company there was the *Nouvelle France* and the *Louisiana* companies, which had been formed by the French. A great contest arose between us and the French in this part of the country, and the first war was concluded by the Treaty of Ryswick, in which the French King recognised the title of William III. to the throne of England; and in return for that William III. recognised what we call the *uti possidetis*, agreeing that the land should remain as it was possessed by the French, no question of right or title being raised. But when we came to the Treaty of Utrecht, in 1713, the French King agreed, not to cede, but to restore, to Queen Anne "all the Bay and Straits of Hudson, and all the coasts, rivers, &c." Commissioners were to be appointed to mark out the boundaries, not landwards, in regard to the sources of rivers, but coastwards; for the real question was, in fact, to determine the extent of Hudson Bay, that portion of water into which these rivers flowed. Those Commissioners were never appointed: consequently no boundary was ever determined under that treaty between the English and French possessions. Now, the question which Captain Synge raised about the French possessions extending indefinitely northwards, was the great argument used by the United States Government against ourselves in 1846, in connexion with the Oregon boundary, in regard to which it claimed to have succeeded to the French rights in Louisiana, which originally belonged to the French, and who really penetrated as far north as the Athabaska Lake, where Mackenzie, in his first great exploration, discovered the remains of two small French settlements. The Americans claimed 49° as the boundary, alleging that that was the line agreed upon at the Treaty of Utrecht as the boundary between the English and French possessions, and claiming to have succeeded to the French title under that treaty. But in 1763, after the siege of Quebec, when the whole of Canada was ceded to us, the French Governor, the Marquis de Vaudreuil, named the Red Lake, where the waters commence to flow northwards, as the northernmost point of Canada; and therefore, so far, conceded that the political boundary of the French possessions did not extend higher than the Red Lake. He now came to what really was the meaning of the charter of the Hudson Bay Company. That charter gave the Company all the country, all the coasts, and all the rivers flowing into Hudson Bay and Hudson Straits. Whatever questions might arise as to that definition, about the rivers there was no diffi-

culty whatever, because after the Treaty of Utrecht all the rivers flowing into Hudson Bay were conceded to be British rivers. It seemed to him, therefore, that the historical view was opposed to what Captain Synge had stated, further than the fact of the extension of French settlements of hunters as far as the Lake Athabaska. Nor was the argument quite consistent with the legal interpretation of the word "rivers." At the same time what he had told us was extremely interesting, because of the great prospective importance of that country; it possessed enormous mineral wealth, which would one day be explored and worked.

Captain SYNGE expressed his satisfaction that the question had been taken up in the manner in which it had been dealt with by Dr. Twiss. The opening of the country as a route to the Pacific appeared close at hand, and it was this circumstance that gave so great, immediate, and practical an interest to the subject. He had been greatly struck eleven years ago when first bringing before the Society the physical geography of the country of interior British North America, as proving the feasibility of such a route, and the particulars of the direction-posts and characteristics of the latter, that the discussion which ensued instantly took the form of an attack on the Hudson Bay Company. He subsequently found all those who were in favour of the country were strongly under the impression that the Company was the obstruction really in the way. Now he himself at that time knew the Hudson Bay Company only by name. He had not then examined the charter at all. Satisfied that no such antagonism existed between the assumed proprietary of so magnificent a territory and those who were strenuously seeking to develop its resources to the utmost, he brought this view under the consideration of the Board of the Company; but without effect. The reply practically amounted to this—that the fur-trade was remunerative and met all their desires. The Company had not, however, been content with a passive opposition. They were, in fact, in many forms the vigorous opponents of every effort to open up the country. The position was, therefore, this:—The Company apparently most interested in the success of the efforts he and others were contending for, were the most resolutely hostile to all those efforts. There appeared, therefore, but one alternative as a solution of this line of conduct. Either we must be entirely mistaken as to the value of the country and of the route, or tenure of that country by the Company was invalid. He had purposely confined himself as much as possible to the geographical investigation of the limits of Rupert Land, and had intentionally glanced as briefly as possible at the historical confirmation of the limits as he had sketched and believed them to be; but he hoped he had shown it to be beyond dispute that Rupert Land was held as a trust only, and that the object of that trust was identical with that which gave its present interest to the question, viz. the opening of a communication with the Pacific. He could not adopt the principle contended for by Dr. Twiss, that the inland navigations of North America came under the category of rivers. The great lakes were not the St. Lawrence. Under any circumstances all the interior country, as he had shown he trusted, sufficiently clearly, however briefly, came under the excepting clause. The Hudson Bay Company evidently had no claim to it; nor, until recently, had they advanced any under their charter. In 1817, when the Hudson Bay and the North-West Companies were brought face to face, the Hudson Bay Company made no pretension to monopoly; they did not call upon the Government to protect them: but the most peremptory instructions were sent by the Home and Colonial Governments that the conflicts of the Companies' servants were to be put a stop to, and all impediments raised on either side against any traders or others of the King's subjects were to be removed. If their monopoly dated from 1803, how could they claim it under their charter? The question could not be avoided, for the settlement of the

country, shown to be imminent, could not take place without the grant and transfer of land. It became indispensably necessary therefore to inquire with whom, if with any one but the Crown, a title to grant lay, and to what that title amounted and over what it extended. To effect a legal transfer there must be a legal title. That title, if legal, extended over Rupert Land. Hence the interest and importance of the question—What are its limits?

The PRESIDENT, in thanking Captain Synge for his communication, said the Geographical Society, happily, were not called upon to settle that question.

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2. *On the discharge of Water from the Interior of Greenland, through Springs underneath the Ice.* By DR. H. RINK, of Greenland.

DR. RINK calculates the yearly amount of precipitation on Greenland, in the form of snow and rain, at 12 inches, and that of the outpour of ice by its glaciers at 2 inches. He considers that only a small part of the remaining 10 inches is disposed of by evaporation, and argues that the remainder must be carried to the sea in the form of sub-glacial rivers. He shows that copious springs of fresh water boil up through the sea in front of the glaciers that advance into it, and states that their positions are conspicuously pointed out by flocks of sea-birds, which invariably hover over them in evident search of some food, whatever it may be, which they always find there. He also specifies a lake adjacent to the outfall of a glacier into the sea, which has an irregularly intermittent rise and fall. Whenever it rises the sea-springs disappear; when it sinks they burst out afresh, showing a direct connection between the springs and a sub-glacial river. Arguing from what has been observed in the Alps, he concludes that an amount of glacier-water equivalent to 10 inches of precipitation on the whole surface of Greenland, is no extravagant hypothesis, and he accounts for its presence partly by the transmission of terrestrial heat to the lowest layer of the ice, and partly from the fact that the summer heats are conveyed into the body of the glacier, while the winter cold never reaches it. The heat melts the surface-snow into water, which percolates the ice, while the cold penetrates a very inconsiderable portion of the glacier, whose thickness exceeds 2000 feet.

The PRESIDENT said this was a most important communication. Dr. Rink brought before them the most convincing proof of the truth of what had been long established by the labours of Agassiz, Forbes, and Charpentier, and other geologists, that glaciers were simply frozen rivers; and, in showing that these frozen masses move to the coast, he has calculated that about one-sixth of their whole volume really consists of water. The subject was of great interest, particularly to persons who, like himself, happened to have been born in the north of Scotland; because geologists had recently satisfied themselves that all the northern part of Scotland has been under pre-